Frederick H. Blodgett

THE MARYLAND
AGRICULTURAL EXPERIMENT STATION

STATE HORTICULTURAL DEPARTMENT.

CIRCULAR BULLETIN No. 37. MARCH, 1902.

THE PERIODICAL CICADA.

By A. L. Quaintance, State Entomologist.

The periodical cicada, or seventeen year locust, is scheduled to appear during the spring of the present year in the following counties of Maryland: Allegany, Anne Arundel, Baltimore, Caroline, Carroll, Cecil, Frederick, Garrett, Harford, Howard, Kent, Montgomery, Prince George, Queen Anne, Talbot and Washington.

Judging from records of the occurrence of the last brood, the insect is not likely to make its appearance in Charles, St. Mary's, Dorchester, Wicomico, Worcester and Somerset Counties.

This is the largest of the seventeen year broods, and will occur more or less in the following States: Alabama, Delaware, District of Columbia, Georgia, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, New Jersey, New York, North Carolina, Ohio Pennsylvania, Tennessee, Vermont, Virginia, West Virginia and Wisconsin. The accompanying map, Figure 1, will serve to indicate the distribution of this brood as determined by the Division of Entomology, U. S. Department of Agriculture from their records of the 1885 brood, the date of its last occurrence.

While it cannot be said that the occurrence of the insect will be limited exactly to the area above indicated, yet, it will not likely vary far from it. The severity of the brood over any given territory will naturally be variable, and nothing definite can hardly be stated on this point. From the nature of the country, however, some inference may be drawn as to their probable relative local abundance. The insects are likely to be most numerous in forest groves, particularly of white oak or other woods where the natural conditions have been but little disturbed. High and well-drained situations, where the soil is a rich sandy loam, seem also to be favorite localities. Fruit trees planted the past fall or the present spring on land that has been but recently cleared, will very probably be severely injured. The sluggish habits of the adult tends rather to concentration than to dissemination, and the insects do not ordinarily move far from the point of their emergence.

Economically, the cicada is of interest only in connection with its egg-laying habit. The injury done to the roots by the larvae is

scarcely noticeable, but the numerous punctures made by the females in the twigs and smaller branches of trees in the course of ovipositing are frequently the source of considerable loss. This is particularly true of young fruit orchards and ornamental shrubs and the like; but it cannot be said that the cicada is very particular as to the plants selected for her eggs, for while a preference is shown usually for oaks, hickories and the apple, yet, any plant at hand is likely to be used.

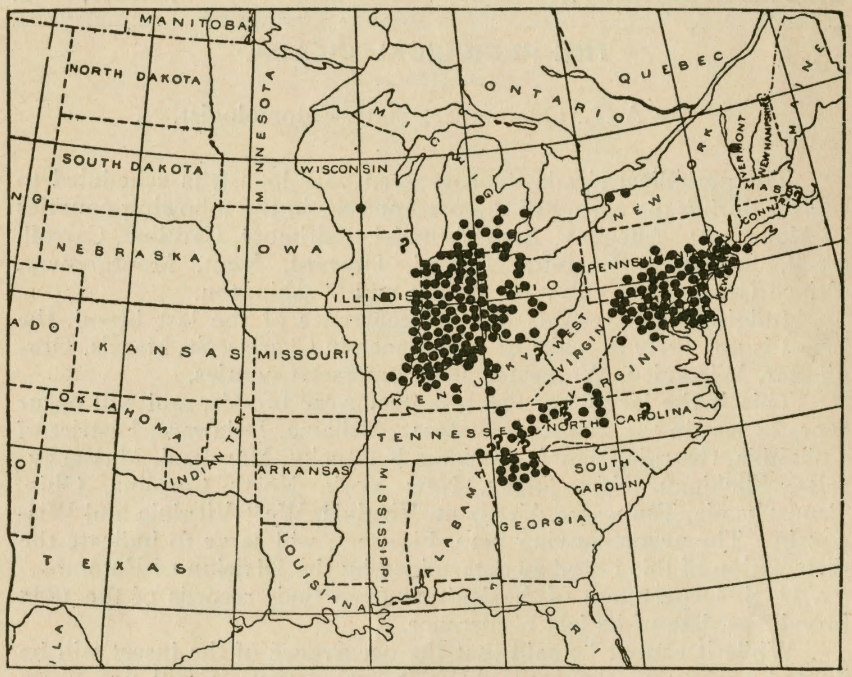

FIGURE 1. (AFTER MARLATT.)

The particular part of the plant selected for the eggs is usually the twigs of last year's growth, and while older and harder wood is at times used, such situations are not preferred, as shown by the relatively small number of punctures made. Injury from cicada punctures on such favorite trees as oak, hickory and apple is likely to be quite noteworthy. Young apple and other orchards more or less surrounded by woods, or on recent clearings, are likely to suffer worst. The punctures in such trees so weaken the twigs that they may be broken off, and in those that remain the after-effect may be quite serious from the warty and knotty-like wounds, which as long as they remain open, are a source for the entrance of various injurious fungi and germs of decay. Mr. Hopkins has observed that these cicada wounds, on account of the protection offered, furnish a favorite place for colonies of the woolly aphis, which serve greatly to aggravate the

case by preventing proper healing, and causing additional abnormal growth.

The life-story of the insect, though more or less generally known, is exceedingly interesting and may be here briefly given. The eggs are deposited mostly in the month of June in this latitude, each female laying from three hundred to five hundred eggs, in numerous ragged slits, made by means of her strong ovipositor, in various shrubs and trees. From six to eight weeks are required for the eggs to hatch. When the larvae emerge from the twigs and fall to the ground, they immediately burrow below in some crack or groove, thus beginning their long subterranean life. The food of the nymph of the cicada is the juices which they suck from the smaller roots of trees and plants with their beaks. The larvae construct tight earthen cells around some root and apparently live within this particular cell until almost ready to emerge to the world above, seventeen years later.

The depth to which the nymphs may burrow beneath the soil is evidently variable, and is reported as from twelve inches, eighteen inches and twenty-four inches, to ten feet, the former figures no doubt representing the more usual depth. The tendency is to penetrate sufficiently below the surface to secure protection from the inclemency of the weather. In leaving the cell, the active nymph or pupa quits its cell, boring directly upwards until at or near the surface of the ground, where it may remain for a short time, and until quite ready for the final transformation. Leaving the ground usually between sundown and ten o'clock, it crawls to a nearby upright object of almost any description, and in the course of an hour the adult escapes by working its way out of the old shell through a split in the back. The old cases are left clinging to the object of support, and will be very frequently noticed on the trunks of trees, shrubs, fence posts and the like the present year. The adult cicada is at first very soft, and the wings but little developed, but these gradually expand, the body broadens and by the following day, it is ready to enter into the full enjoyment of its brief aerial life of about thirty days. The noise of singing is made only by the males.

Figure 2 illustrates the seventeen-year cicada. 1, shows a newly-hatched nymph; a, a full-grown nymph or pupa; b, the cast pupa shell clinging to its object of support; at c, the adult is shown, and at e, two eggs enlarged; 3 illustrates a female in side view, showing the beak at a.

In figure 3 the egg-nests of the cicada are shown; a, illustrates a recent puncture, as seen from the outside, and b, the same with the surface removed, showing the arrangement of the eggs; c is a side view of the same, while d illustrates the cavity after the eggs have been removed. At the right is a twig healed after the punctures of the female.

As to the expediency of planting a young orchard during the fall or spring preceding a cicada year, there is considerable uniformity

of opinion among entomologists. Thus Dr. Hopkins in bulletin 50 of the West Virginia Experiment Station says on page 45: "Never plant orchards in the fall previous to a cicada year, or in the spring of the year the cicada is due to appear in that locality." Mr. Marlatt states in Bulletin 14, new series, Division of Entomology, U. S. Department of Agriculture, on page 110: "The advent of all the large and well-recorded broods is commonly given in advance in the local

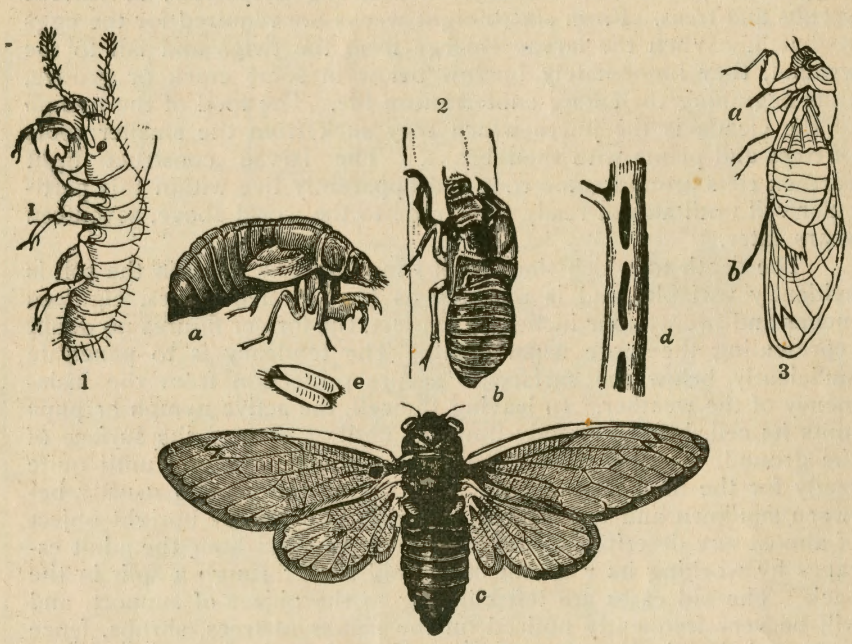

FIGURE 2. (AFTER RILEY.)

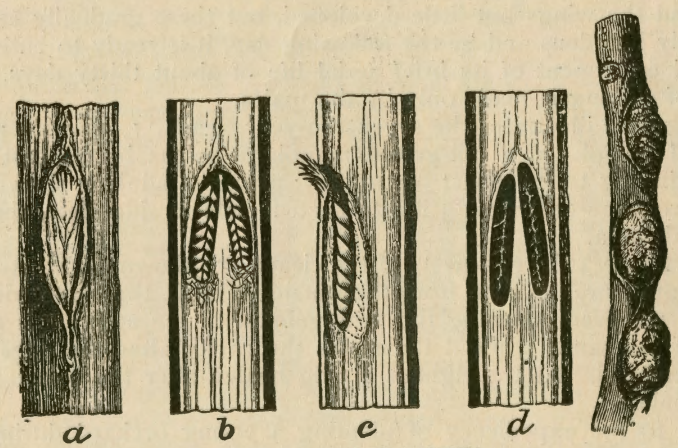

FIGURE 3. (AFTER RILEY.)

papers by State Entomologists and other persons who take an interest in such occurrences. Forewarned in this way, much injury and loss may be avoided by neglect of pruning during the winter and spring prior to the expected appearance of the cicada, in order to offer a large twig growth and distribute by this means the damage over a greater surface. Another protection when a cicada year is expected is to defer planting of orchards, especially in the vicinity of old orchards or forest lands, until the danger is past. The same advice applies to budding and grafting operations in the fall and spring previous to the cicada's appearance."

Dr. Smith, of New Jersey, thus advises growers in sections where the cicada is scheduled to appear in 1902: "Do not set out orchards in the fall of 1901, or in the spring of 1902, if this can be avoided. If trees are planted, however, they should not be pruned too closely. Leave as many shoots and branches as possible, on which the insects may lay their eggs, without harm to the tree itself. These branches may be trimmed out in July, as soon as the danger is past. Do not trim your trees or shrubs too closely, and where not absolutely necessary do no trimming at all. Do no budding or grafting either in the fall or spring, as growing buds and grafts are especially apt to be injured."

If young orchards, however, have been planted, and the trees have been affected, all seriously injured branches should be cut out. In the case of trunks of young trees badly wounded, it is in most cases advisable to cut the stem off above the point of origin of the bud, or graft, and allow a new shoot to form.

The present brood should be accurately mapped out in the State.

The writer desires to determine as accurately as possible the exact occurrence and relative abundance of the cicada in the various counties of the State the present year. Some time hereafter blanks will be sent out quite generally over the State, with the request that those receiving same will make a report on the various points connected with the occurrence of this brood. It is desired to know the date of the first occurrence of the insects, their period of duration, abundance, and injury inflicted. I will be grateful to anyone for data on these points.

Approved:— H. J. Patterson, *Director*.